APPENDIX B

LOCATING LAND FEATURES ON TOPOGRAPHIC MAPS

UTM COORDINATES

To determine the Universal Transverse Mercator (UTM) coordinates, you will need 1) the 7.5' quadrangle topographic map that covers the site area, 2) a metric scale, and 3) a sharp pencil. The maps are published by the U.S. Geological Survey.

Note that UTM coordinates are metric, whereas all other measures used in this handbook are the English system. Appendix F lists some common conversion factors.

With the help of the map legend, find the tick marks for the UTM grid. Determine which of the grid cells contain the AML site and reference point. With a straight edge, frame the site by drawing lines between opposing tick marks of the grid cells.

When drawing the lines, align the straight edge so the pencil point will intersect the tick marks. Be sure that the edge is not directly over the tick marks or the width of the pencil will offset the framing line. Strive to keep the pencil point against the straight edge at all times.

For the north UTM coordinate, lay the 0 division of the scale on the bottom framing line, and lay the appropriate upper scale division on the upper framing line. The UTM grid is 1000 meters on each side, so the upper framing line should fall on a multiple of 1000 meters that equals the number of included cells.

Slide the scale laterally until it intersects the reference point. Be careful to keep the 0 division and top division on the framing lines.

Read up the scale from the 0 division to the reference point. Add this value to the north coordinate value of the lower framing line. The result is the north coordinate of the reference point.

For the east UTM coordinate, repeat the last three steps except use the left and right framing lines, and place the 0 division of the scale on the left framing line.

To improve map readability, note that the first two digits of the number are printed small, the three trailing zeros are printed intermittently, and some tick marks are not numbered when there is overlapping information.

The framed area of the map makes an excellent base for a Location Map. Label the framing lines with their UTM coordinates, cut the area out or copy including the last leg of

easily recognizable access, and attach to the AML Inventory Form in the space provided for the location sketch.

PUBLIC LAND RECTANGULAR SURVEY SYSTEM (LAND SUBDIVISION) - SECTION, TOWNSHIP, AND RANGE

For land subdivision, the area between a pair of standard parallels and a pair of guide meridians is subdivided into approximate 36 square mile areas (approximately 6 miles on a side). These areas are defined as Townships, and a system was devised to designate the location of a particular Township and its subdivisions. This system provides a backup check for the location of an AML site. See Fig. B1 for an illustration of the system.

The east-west rows of Townships are counted north or south from a baseline, for example Township 3 South (T3S). A Range is a north-south column of Townships which are counted east or west from a principal meridian, for example Range 93 West (R93W).

The Townships are divided into approximate squares of land of sides approximately one mile long, and these subdivisions are called Sections. The sections are numbered as shown in Fig. B1.

Sections are subdivided into quarters and into quarters or halves of quarters. These quarters are not shown on the 7.5' quadrangle maps and must be determined with the template provided in the pocket of the back cover. A particular subdivision is designated starting with the smallest subdivision first and expanding to the next largest subdivision followed by the Township and finally the Range. For example, in Fig. B1 a point is given in the illustration of a section subdivision along with its designation.

Some townships are smaller than the standard size. In this case, the subdivision is done by running section lines parallel to the east and north boundaries so as to place all error and convergence into the west and south tiers of sections. In these small townships, align the section template in the northeast corner.

REFERENCE: Kelly, T.A., Plane Surveying Field Manual, Colorado School of Mines, Golden CO, 1964, 229 p.

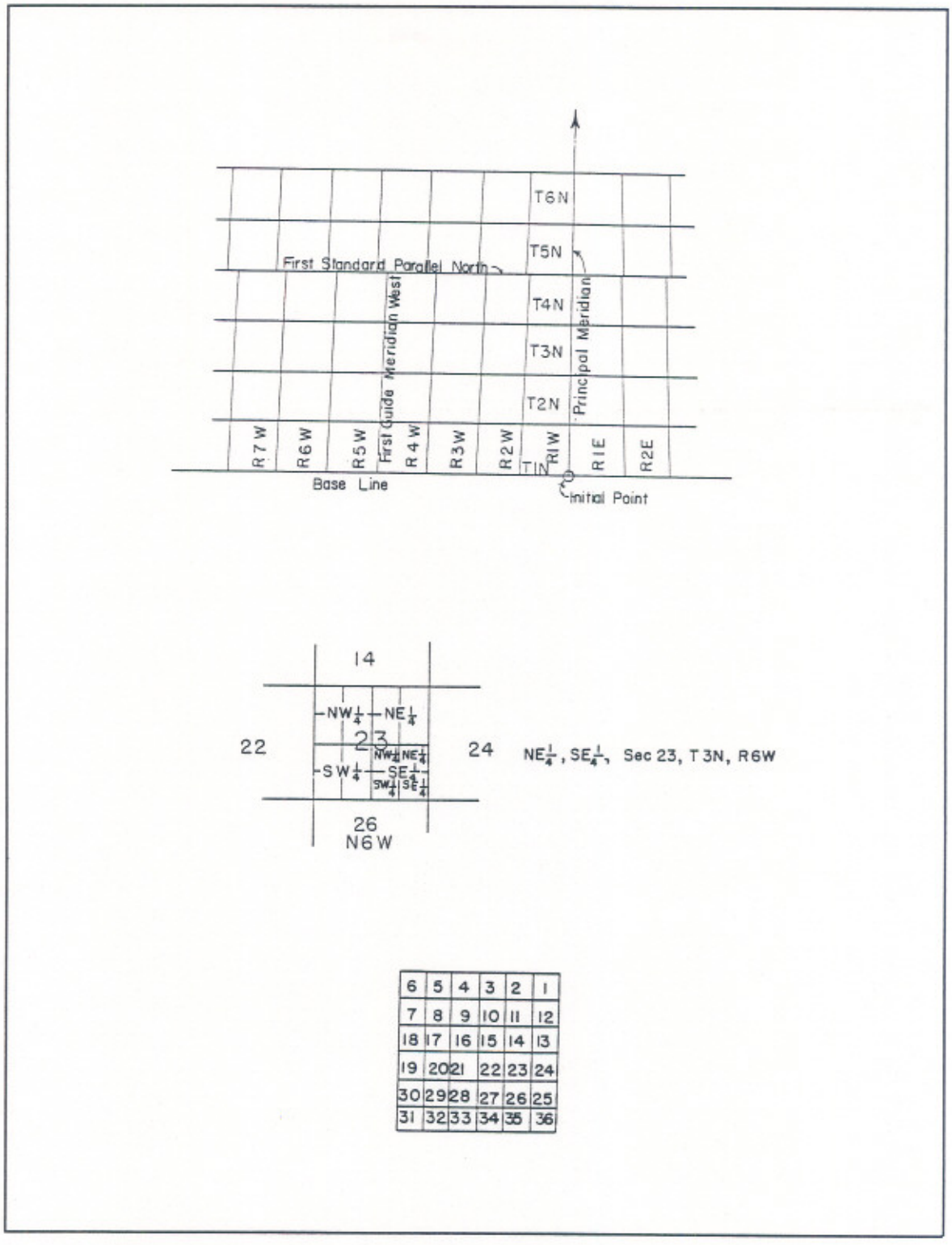

Figure B1. Township/Section Location System
(Kelly, 1964, p.86)